MATERIAL SAFETY DATA SHEET

SRM Supplier: National Institute of Standards and Technology
Standard Reference Materials Group
100 Bureau Drive, Stop 2321
Gaithersburg, Maryland 20899-2321

SRM Number: 3072
MSDS Number: 3072
SRM Name: Diquat Dibromide in Water
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SECTION I. MATERIAL IDENTIFICATION

Material Name: Diquat Dibromide in Water

Description: A unit of SRM 3072 consists of five 2 mL ampoules, each containing approximately 1.2 mL of solution.

Other Designations: Diquat Dibromide (6,7-dihydrodipyrido(1,2-A:2',1'-C)pyrazinediium dibromide; 6,7-dihydrodipyridol(1,2-A:2',1'-C)pyrazinediium dibromide; 1,1'-ethylene-2,2'-dipyridylium dibromide; 1,1-ethylene-2,2'-dipyridylium dibromide; 1,1-ethene-2,2'-dipyridylium dibromide) in **Water** (dihydrogen oxide)

Name	Chemical Formula	CAS Registry Number
Diquat Dibromide	$C_{12}H_{12}N_2Br_2$	85-00-7

DOT Classification: Not hazardous by DOT regulations

Manufacturer/Supplier: Available from a number of suppliers

SECTION II. HAZARDOUS INGREDIENTS

Hazardous Component	Nominal Concentration (%)	Exposure Limits and Toxicity Data
Diquat Dibromide	0.0004	ACGIH TWA: 0.5 mg/m^3
		ACGIH TWA: 0.1 mg/m^3 (total particulate)
		OSHA TWA: 0.5 mg/m^3
		Man, Oral: LD_{LO}: 750 g/kg
		Man, Oral: LD_{LO}: 1 514 μL/kg
		Woman, Oral: LD_{LO}: 400 μL/kg
		Rat, Oral: LD_{50}: 120 mg/kg

SECTION III. PHYSICAL/CHEMICAL CHARACTERISTICS

Diquat Dibromide	
Appearance and Odor: solid yellow crystals; odor not available	**Vapor Pressure (@ 20 °C):** not applicable
Relative Molecular Mass: 344.07	**Evaporation Rate (ether = l):** not applicable
Density (water = 1): 1.22 to 1.27	**pH:** not applicable
Boiling Point: not applicable	**Water Solubility:** 70 %
Freezing Point: not applicable	**Solvent Solubility:** slightly soluble in alcohol and hydroxylic solvents

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point: Not Applicable **Method Used:** Not Applicable **Autoignition Temperature:** Not Applicable

Flammability Limits in Air (Volume %): **UPPER:** Not Applicable
LOWER: Not Applicable

Unusual Fire and Explosion Hazards: Diquat dibromide is a slight fire hazard.

Extinguishing Media: Use regular dry chemical, carbon dioxide, water, or regular foam.

Special Fire Procedures: Fire fighters should wear a self-contained breathing apparatus (SCBA) with a full face piece in the pressure demand or positive mode and other protective clothing.

SECTION V. REACTIVITY DATA

Stability: **__X__ Stable** **_____ Unstable**

Conditions to Avoid: Avoid heat, flames, and sources of ignition. Avoid contact with the skin. **DO NOT** allow the material to contaminate water sources.

Incompatibility (Materials to Avoid): Diquat dibromide is incompatible with metals and oxidizing agents.

See Section IV**:** *Unusual Fire and Explosion Hazards*

Hazardous Decomposition or By-products: Thermal decomposition of diquat dibromide may produce halogenated compounds, oxides of carbon, and nitrogen.

Hazardous Polymerization: **_____ Will Occur** **__X__ Will Not Occur**

SECTION VI. HEALTH HAZARD DATA

Route of Entry: **X** **Inhalation** **X** **Skin** **X** **Ingestion**

Diquat Dibromide: Inhalation of diquat dibromide may cause irritation of the mouth and upper respiratory tract with coughing, chest pains, and nasal bleeding. Repeated or prolonged exposure produced inflammatory changes in the peribronchial and perivascular connective tissues, dystrophic changes in the kidney and abnormal enzyme levels in the liver in experimental animals.

Skin contact with the dilute liquid or dust formulations may result in reversible skin irritation. Concentrated solutions may cause severe irritation and burning of the skin with a color change and softening of the fingernails. Concentrated doses may also delay the healing of superficial cuts and interfere with nail growth. Daily applications to experimental animals produced erythema, thickening, and scabbing.

Eye contact with the dilute liquid may cause irritation. Repeated or prolonged exposure may cause conjunctivitis.

Ingestion of concentrated solutions may cause severe irritation of the mucous membranes of the mouth, pharynx, esophagus, and stomach, followed by nausea, vomiting, diarrhea, and abdominal pains. Damage to the intestinal lining may occur resulting in dehydration and bloody stool.

Medical Conditions Generally Aggravated by Exposure

Listed as a Carcinogen/Potential Carcinogen:

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens		X
In the International Agency for Research on Cancer (IARC) Monographs		X
By the Occupational Safety and Health Administration (OSHA)		X

EMERGENCY AND FIRST AID PROCEDURES:

Skin Contact: Remove contaminated shoes and clothing. Rinse affected area with large amounts of water followed by washing the area with soap and water. Watch for chemical irritations and treat them accordingly. Obtain medical assistance if necessary.

Eye Contact: Immediately flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Obtain medical assistance.

Inhalation: If inhaled, move the victim to fresh air. If breathing is difficult, give oxygen; if the victim is not breathing, give artificial respiration. Obtain medical assistance if necessary.

Ingestion: If ingested, wash out mouth with water. Obtain medical assistance immediately.

TARGET ORGAN(S) OF ATTACK: none reported

SECTION VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be Taken in Case Material Is Released or Spilled: Notify safety personnel of major spills and/or leaks. Evacuate nonessential personnel. Stop the leak if one can do so without risk. Absorb small spills with sand or other absorbent material and place into containers for disposal. **DO NOT** flush into a sewer. Keep out of watersheds and waterways.

Waste Disposal: Follow all federal, state, and local laws governing disposal.

Handling and Storage: Persons handling this material must wear protective eyewear, clothing, and gloves to prevent contact with this material.

NOTE: Contact lenses pose a special problem; soft lenses may absorb irritants and all lenses concentrate them. **DO NOT** wear contact lenses in the laboratory.

Sealed ampoules, as received, should be stored in the dark at a temperature lower than 30 °C.

SECTION VIII. SOURCE DATA/OTHER COMMENTS

Sources: MDL Information Systems, Inc., MSDS *Diquat Dibromide*, 18 September 2001.
The Sigma Aldrich Library of Chemical Safety Data, Ed. II, 1988.